G. A. MILLER: "Independent generators of a group of finite order."

C. N. HASKINS: "On the zeros of the function, $P(X)$, complementary to the incomplete gamma function."

EDWARD KIRCHER: "Group properties of the residue classes of certain Kronecker modular systems and some related generalizations in number theory."

C. DE LA VALLÉE POUSSIN: "Sur l'intégrale de Lebesgue."

G. E. WAHLIN: "A new development of the theory of algebraic numbers."

A. F. CARPENTER: "Ruled surfaces whose flecnode curves have plane branches."

THE opening (October) number of volume 22 of the *Bulletin of the American Mathematical Society* contains: Report of the twenty-second summer meeting of the society, by Thomas Buck; "Groupless triad systems on fifteen elements," by Louise D. Cummings and H. S. White; "Note on Green's theorem," by C. A. Epperson; "Convergence of the series

$$\sum_{i=0}^{\infty} \sum_{j=0}^{\infty} \frac{x^i y^j}{i - j\gamma}$$

(γ irrational)," by W. D. MacMillan; "A certain class of functions connected with Fuchsian groups," by Arnold Emch; "Professor Bôcher's views concerning the geometry of inversion," by Eduard Study; "The Davis calculus," by E. W. Davis; "Notes"; and "New Publications."

THE November number (Vol. 22, No. 2) of the *Bulletin* contains: "On the relation between linear algebras and continuous groups," by L. E. Dickson; "An aspect of the linear congruence with applications to the theory of Fermat's quotient," by H. S. Vandiver; "Limits of the degree of transitivity of substitution groups," by G. A. Miller; "The permutations of the natural numbers can not be well ordered," by A. B. Frizell; "Relations among parameters along the rational cubic curve," by J. E. Rowe; Review of Vallée Poussin's Cours d'Analyse Infinitésimale, third edition, by M. B. Porter; Review of Zeuthen's Lehrbuch der abzählenden Methoden der Geometrie, by E. S. Allen; Review of Carslaw's Teaching of Mathematics in Australia, by R.

C. Archibald; "Shorter Notice": Loria's Per la Biografia di Giovanni Ceva, by D. E. Smith; "Notes"; and "New Publications."

SPECIAL ARTICLES

THE MOUNTING OF CELLOIDIN SECTIONS IN SERIES

INVESTIGATORS in both normal and pathological plant histology have to often resort to celloidin for embedding parts of plants which contain a considerable amount of lignified tissue, as the sections are very apt to break up badly in cutting if the material is embedded in paraffin.

The process of cutting and mounting celloidin sections is very simple if only occasional sections are required for study, as they can be stained and mounted separately. It is sometimes desirable, however, to examine a whole series of sections, in which case it is necessary to stick the sections to a slide before staining them, which greatly increases the difficulty. Plowman[1] has described a method of this kind which very briefly is as follows: As the sections are cut they should be transferred to a piece of smooth thin paper, and when they are dry the paper should be turned face downward on a slide which has previously been coated with albumen fixative. Add several layers of paper, press down, and roll with a roller. Place another slide on top of the sections, clamp down, and dry for a few hours.

I have had occasion to use the above described method on various occasions with rather poor success. The paper is very apt to stick to the edges of the sections and either tear them badly or pull some of them away from the slide when the paper is finally removed. The use of oiled paper will not entirely obviate this difficulty unless the paper is very oily, in which case it is apt to prevent some of the sections from sticking to the slide if some of the oil gets beneath them. I have found, furthermore, that it is necessary to use a much thicker solution of albumen than for paraffin sections, which is apt to become deeply colored in the subsequent staining, resulting in messy looking slides.

[1] *Bot. Gaz.*, 37, pp. 456–461.

Land[2] has recently described a fixing fluid for paraffin sections which is much superior to the albumen fixative in general use. I have been using a similar fluid for some time and have found that it works equally well for celloidin sections, and much better than the albumen method of fixation as described by Plowman. Land gives a formula for making the fluid for paraffin sections, but for celloidin sections I have found that by placing a few small pieces of gum arabic in distilled water and shaking until the bubbles formed cease to break readily, enough of the gum will be dissolved to answer all purposes. A sufficient amount of potassium bichromate should be added to give the fluid a slightly yellow color. Land advises adding the bicromate when the sections are mounted, but by preserving the fluid in a blackened bottle it will keep in good condition for months.

Two methods may be used in mounting the sections. If they are small and the entire series can be arranged on one or two slides, the knife can be wet with 90 per cent. alcohol when cutting, and the sections removed to a clean slide as they are cut. After the slide has been covered with sections, the alcohol is allowed to dry, or is removed with a small piece of filter paper. A drop of the fixing fluid is now added and the slide tilted to allow it to run underneath the sections. The excess of fixing fluid should be removed by placing a piece of filter paper on top of the sections and gently pressing down. If care is exercised in doing this it is very seldom that any of the sections will adhere to the paper. Occasional sections that do adhere, however, can be easily removed from the paper and put in place again. Another slide should be slightly oiled and placed on top of the sections, after which it is clamped down. The slide should be left to dry in strong sunlight for a few hours.

If the sections are rather large and it is not necessary to save the entire series, the knife can be wet with glycerine alcohol and the sections removed to a large slide or piece of glass as they are cut. Such sections as are needed

[2] *Bot. Gaz.*, 59, pp. 397–401.

for study can be subsequently transferred to another slide, first carefully washing them to remove all traces of glycerine.

If care is taken in removing the excess of fixing fluid from the sections at the start, the oiled slide can be removed after drying without injuring any of them. I have mounted as many as one hundred rather large sections in series by this method and they all came through in perfect condition.   ALBAN STEWART

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THE RÔLE OF ANOPHELES PUNCTIPENNIS SAY IN THE TRANSMISSION OF MALARIA

As the result of recent experiments conducted in New Orleans, Louisiana, *Anopheles punctipennis* Say has proved itself to be an efficient medium for the development of the sexual cycle of the organism of tertian malaria, *Plasmodium vivax*.

Of previous attempts to determine the exact status of this species of *Anopheles* the most thorough was that of Hirschberg who in a series of carefully executed experiments obtained only negative results in infecting *A. punctipennis* with the gametes of estivo-autumnal malaria. As further evidence of this negative rôle, he states that no cases of malaria were found to be developing in a certain section of Maryland where the species was common, and that he had never found naturally infected *punctipennis* here or elsewhere as had been done with *A. quadrimaculatus*.

Dupree, however, in a list of efficient hosts of malaria includes *punctipennis* as having been so determined by himself. No other details are given and Knab in 1913 was inclined to the belief that he had in reality experimented with *A. punctipennis*, which is now recognized as a distinct species and as an efficient host.

Anopheles punctipennis is one of the common species of the genus in the United States and because of its abundance and wide distribution the question of its agency in the spread of malaria is an important one. To record the fact that the parasites of one form of the disease may successfully develop in this species is the purpose of the present note, which will